REPORT RESUMES

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THREE STUDIES IN ELEMENTARY SPELLING INSTRUCTION.

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THREE STUDIES UNDERTAKEN AT BRIGHAM YOUNG UNIVERSITY ATTEMPTED TO ASSESS THE RELATIVE EFFICIENCY OF THE UNIVERSITY'S INDIVIDUALIZED APPROACH AND A WHOLE-CLASS APPROACH TO TEACHING SPELLING IN THE ELEMENTARY GRADES. THE FIRST-YEAR STUDY UTILIZED THESE TWO APPROACHES IN GRADES TWO THROUGH SIX. THE SECOND-YEAR PROJECT CONTINUED THE USE OF THESE METHODS IN THE SECOND AND THIRD GRADES, BUT UTILIZED FOUR METHODS IN GRADES FOUR THROUGH SIX BY USING, IN SOME CLASSES, THE SCIENCE RESEARCH ASSOCIATES' SPELLING LABORATORY IN COMBINATION WITH EACH OF THE ORIGINAL METHODS. THE THIRD WAS A LONGITUDINAL STUDY BASED UPON DATA FROM THE OTHER TWO. THE INDIVIDUALIZED METHOD PROVED TO BE RESPONSIBLE FOR AT LEAST AS MUCH SPELLING GROWTH AS THE WHOLE-CLASS METHOD. HOWEVER, PRIMARY STUDENTS OF LOW READING ABILITY APPEARED TO BENEFIT MORE FROM THE WHOLE-CLASS APPROACH. SYSTEMATIC, INDIVIDUALIZED INSTRUCTION IN SPELLING PRINCIPLES WAS FOUND TO BE VALUABLE IN CONJUNCTION WITH EITHER METHOD, PARTICULARLY IN THE FOURTH AND FIFTH GRADES WITH STUDENTS OF MEDIUM OR LOW READING ABILITY. THAT THE LONGITUDINAL STUDY IDENTIFIED MORE SIGNIFICANT DIFFERENCES BETWEEN THE METHODS TESTED THAN DID EITHER OF THE OTHER STUDIES INDICATES THE VALUE OF USING A METHOD AT LEAST TWO YEARS BEFORE JUDGING ITS EFFICIENCY. (RD)

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Three Studies In
Elementary Spelling Instruction

Education Experimental Programs
College of Education
Brigham Young University
Provo, Utah

October 1, 1964

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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THREE STUDIES IN ELEMENTARY SPELLING INSTRUCTION

1. A Comparison of the Relative Efficiency of the Individualized Approach and the Whole-Class Approach to Spelling Instruction in Grades Two through Six (First-Year Study)
2. A Comparison of the Relative Efficiency of Two Approaches to Spelling Instruction in Grades Two and Three and Four Approaches to Spelling Instruction in Grades Four through Six (Second-Year Study)
3. A Two-Year Longitudinal Study of Individualized and Whole-Class Approaches to Spelling Instruction in Grades Two through Six

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I.

A COMPARISON OF THE RELATIVE EFFICIENCY OF THE INDIVIDUALIZED APPROACH AND THE WHOLE-CLASS APPROACH TO SPELLING INSTRUCTION IN GRADES TWO THROUGH SIX[1]

(First-Year Study)

General Purpose

The general purpose of this study was to determine if the individualized approach to spelling instruction is more efficient than the whole-class approach in the elementary grades.

Even though spelling is one of the minor subjects in a school curriculum, the ability to spell plays a very important role at nearly all levels of schooling as well as in many aspects of post-school activities.[2] The child who has the ability to spell well has immediate advantages in life over the poor speller, and the errors of the poor speller detract from the effectiveness of his written work and may embarrass him in personal and business affairs. "The advantages of good spelling ability and the disadvantage of poor spelling ability amply justify careful, systematic planning for helping pupils learn to spell correctly."[1]

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[1] It was the original intention of the researchers to include first grade students in the study. However, examination of data obtained from first grade classes revealed that it was impossible to determine the effects of spelling instruction on the test scores. Therefore the study does not include the first grade.

[2] Fitzgerald, James A. The Teaching of Spelling. Milwaukee: The Bruce Publishing Co., 1951. pp. 3-4.

The need for good spelling and the ever increasing need for more efficient utilization of time create the desirability of finding the best possible method of teaching spelling.[2]

During the past half century, several methods of teaching spelling by whole-class methods have been tested. Methods that appear to prove most efficient are the study-test-study-test method up to the middle part of the third grade, and the test-study-test method above the middle of the third grade.[3,4]

Research and experience have shown that the range of spelling ability and achievement of students in any grade is very great.[5] This points to the need to provide for individual differences in spelling instruction.[6] Attempts have been made to satisfy this need. One attempt resulted in the development of an individualized approach to the teaching of spelling at the Brigham Young University Laboratory School.

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[1] Horn, Ernest. What Research Says to the Teacher. Pamphlet of the Department of Classroom Teachers, American Education Research Association of the National Education Association, No. 3, January, 1954. Washington D.C.: the Association, 1954. p. 3.

[2] Horn, Thomas D., and Otto, Henry J. Spelling Instruction: A Curriculum-Wide Approach. Bureau of Laboratory School, U. Texas, 1954. p. 15.

[3] Gates, Arthur I. "An Experimental Comparison of the Study-Test and Test-Study Methods in Spelling." Journal of Educational Psychology (January, 1931) 22, p. 1-19.

[4] Kingsley, John H. "The Test-Study Method Versus the Study-Test Method in Spelling." Elementary School Journal (October, 1923) 24, p. 126-129.

[5] Horn, Thomas D., op. cit., p. 15.

[6] Ibid., p. 14.

Problem

In order to discover whether or not the individualized approach to spelling is more efficient than the whole-class approach, answers to the following questions were sought:

1. In grades two through six in formal spelling, measured by formal spelling tests, which of the following methods is most efficient:
    a. the B.Y.U. individualized approach developed by the Brigham Young University Laboratory School staff?
    b. the whole-class approach?
2. In grades three through six in formal spelling, which of the following methods, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
3. In grades four through six in functional spelling, measured by counting the number of spelling errors in structured written exercises, which of the following methods of spelling instruction is most efficient:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
4. In grades four through six in functional spelling, which of the following methods, if either, produces significantly greater growth for children with high reading ability, with

medium reading ability, and with low reading ability:

a. the B.Y.U. individualized approach?

b. the whole-class approach?

Definition of Terms

Formal Spelling

Formal spelling was spelling measured by the results of a spelling test. In grades three through six the test consisted of one hundred words randomly selected from the 4,926 words used in the spelling study. In grade two the test consisted of fifty words randomly selected from the first 2,996 words used in the study. There were two forms of each test.

Functional Spelling

Functional spelling was spelling measured by counting the number of spelling errors in five hundred running words in structured written exercises. The written work consisted of (1) the completion of a highly motivating story which had been introduced and begun by the teacher and (2) the completion of structured essay-type reviews related to school, friends, holidays and parties, recreation and summer activities.

High Reading Achievement

High reading achievement was achievement of children in grades three, four, five, and six who scored among the upper third of participating children in their grades on the reading section of the Iowa Tests of Basic Skills.

Medium Reading Achievement

Medium reading achievement was achievement of children in grades three, four, five, and six who scored among the middle third of participating children in their grades on the reading section of the Iowa Tests of Basic Skills.

Low Reading Achievement

Low reading achievement was achievement of children in grades three, four, five, and six who scored among the bottom third of participating children in their grades on the reading section of the Iowa Tests of Basic Skills.

Description of Spelling Methods Used

Individualized Approach

Words used. The words used in the individualized approach included 4,042 most commonly used words in children's writing as listed by Rinsland[1] and organized by Hildreth[2] into eight levels according to frequency of use. In addition there were 884 words used most frequently by adults and not by children as listed by Horn.[3] These words were organized into two levels and appeared as levels nine and ten. The first six levels were organized in groups within each level according to thirty-five word analysis generalizations. Each level had a final group for exceptions. Levels seven, eight, nine, and ten were not arranged according to generalizations because of multi-syllable word classification difficulties, but were arranged alphabetically.

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[1] Rinsland, Henry D. A Basic Vocabulary of Elementary School Children. New York: The Macmillan Company, 1945.

[2] Hildreth, Gertrude. Teaching Spelling. New York: Henry Holt and Company, 1955.

[3] Horn, Ernest. A Basic Writing Vocabulary. Iowa City: University of Iowa, 1926.

Procedures used by the student. Each student was assigned a level in the word list according to his performance on placement tests. Each child chose or was assigned a partner at about his spelling performance level and progressed through the word lists at his own rate of progress by testing with his partner. Missed words were studied by using the eight study steps listed later in this report.

The test-study-test method was used in grades four, five, and six; and a preview-test-study-test method was used in grades one, two, and three. Advanced students used the test-study-test method in the primary grades. The partner administered a pre-test and the student who took the test checked his own test as his partner spelled the words aloud. A student was tested on approximately twenty words. He recorded his errors and administered a pre-test to his partner. Missed words became the first words in the next test with the partner. On a student record sheet the student checked off the groups of words he had passed with his partner.

During three days each week the student tested with his partner, studied his missed words, or tested with the teacher. On the fourth day of each week he did one of these activities or worked independently with the teacher. On the fifth day, a variety day, he learned generalizations or rules that were taught by the teacher, played spelling games, worked on individual or group spelling problems, or studied his functional spelling words.

Procedures used by the teacher. Once each week the teacher found out how far the students had progressed with their partners. He noted this progress in a teacher's record book and tested for delayed recall and review three or four days each week depending on need. He used the fifth day each week as a variety day. When the fourth day was not needed for testing, the teacher circulated among the children and assisted individual children and small groups with specific problems. He assisted students to develop proper spelling habits and guided them in study techniques.

Functional spelling. Words missed in daily writing became a part of the student's spelling program and were recorded in the student's spelling notebook for future study.

Whole-Class Approach

Words used. The words used in the whole-class approach consisted of 2,996 words most commonly used in children's writing as listed by Rinsland[1] and organized by Hildreth[2] into six levels according to frequency of use. The six levels were organized in groups according to thirty-five word analysis generalizations within each level. Each level had a final group for exceptions. Words studied in each grade were assigned as suggested by Hildreth.[3] Minor exceptions were made in order to allow grades to begin and end on given levels. Each grade was assigned specific words which were broken into weekly spelling lists to be used during specific weeks.

Procedures used by student and teacher. In grades four, five, and six the test-study-test method was used. An abbreviated description follows:

Monday. The teacher administered a test on the weekly list. Children corrected their own papers and recorded missed words. These words became the children's spelling words for the week.

Tuesday. During the first ten minutes the teacher directed the entire class in a study of words. After the study period, the teacher worked with small groups or individual children on words missed Monday. Students who scored 100% on Monday were channeled into other independent activities.

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[1] Rinsland, Henry E., *op. cit.*

[2] Hildreth, Gertrude., *op. cit.*

[3] *Ibid.*, p. 309.

Wednesday. The teacher administered a test on the weekly list to the entire class. The teacher followed the same procedures as on Monday.

Thursday. Children who did not score 100% on Wednesday spent Thursday's spelling period studying words missed. Children who scored 100% on the Wednesday test were channeled into other independent activities. Occasionally the teacher used Thursday's period for spelling games.

Friday. The teacher administered a test on the weekly list to the whole class. The same procedures were used as on Monday and Wednesday with the exception that someone other than the child corrected his paper.

Every seventh week was a review week. The words to be studied during this week were taken from the teacher's list of words most frequently missed by children in the class.

In grades two and three a study-test-study-test method was used in which the following weekly schedule was followed:

Monday. The teacher introduced part of the weekly spelling list to the entire class. He discussed appropriate word analysis generalizations which applied to the words and directed study of words using the eight study steps.

Tuesday. The teacher introduced the remainder of the weekly spelling list. The same procedures were followed as on Monday.

Wednesday. The teacher administered a test on the weekly list to the entire class. Children corrected their own papers and recorded misspelled words which became their spelling words for the remainder of the week.

Thursday. Children studied the words missed on Wednesday's test using the eight study steps. The teacher worked with individual students or groups. Children who scored 100% on the Wednesday test were channeled into other independent work during Thursday's period.

Friday. The teacher administered a test on the weekly list to the entire class. The same procedures were followed as on Wednesday with the exception that someone other than the child corrected his paper.

On Monday, Tuesday, or Thursday the teacher sometimes used part of the time in spelling games. The few spelling generalizations which are universal enough to be taught as rules were taught on Monday or Tuesday during the word study period.

Every seventh week was a review week. The words to be studied during this week were taken from the teacher's list of words most frequently missed by children in the class.

Grade Level Variations in Method

The differences in ability and maturity of students on various grade levels made variations in method of teaching within the two general methods necessary. Methods varied according to grade levels as follows:

Second grade. In the whole-class method formal spelling instruction was given to the whole class for a twenty-week period following Christmas vacation. A study-test-study-test method was used. In the individualized method formal spelling instruction was given to students who were considered ready. A preview-test-study-test method was used.

Third grade. In the whole-class method formal spelling instruction was given to all students. A study-test-study-test method was used. In the individualized method formal instruction was given to all students considered ready. A preview-test-study-test method was used.

Fourth, fifth, and sixth grades. In the whole-class method formal spelling instruction was given to all students. A test-study-test method was used. In the individualized method formal spelling instruction was given to all students. A test-study-test method was used.

Research Design

Sample

Participating schools and teachers were selected with the permission and assistance of school superintendents of districts involved.

Students involved in the study came from forty classes, eight classes from each grade, two through six. Students were from seven different schools. One class of each grade from two through six in six different schools different schools, and two classes, grades two through six, in one school were included.

Students who used the individualized method came from schools which drew from similar neighborhoods and socio-economic groups to the schools which the students attended who used the whole-class method. Students who used the individualized method came from four different classes in each grade, two through six--two classes in each grade from an urban community with a population above 25,000 and two classes in each grade from rural communities with populations below 12,000. Students who used the whole-class method came from four different classes in each grade, two through six--two classes in each grade from an urban community with a population above 25,000 and two classes in each grade from rural communities with population below 12,000.

The length of the study was twenty-eight weeks of actual spelling instruction. It began in the fall of 1962 and concluded in the spring of 1963.

Classroom Procedures

Children in the primary grades who used the individualized method began formal spelling instruction as soon as the teacher felt the children demonstrated the following signs of spelling readiness: (1) A child should have a mental age of at least 7½ years. (2) A child should be able to enunciate words clearly. (3) A child should have a beginning phonetic sense and recognize the common letter-sound combinations. (4) A child should have the ability to write and name all the letters of the alphabet correctly. (5) A child should have the ability to copy words correctly. (6) A child should be able to write his own name without copy. (7) A child should be able to write a few simple words from memory. (8) A child should ask for words he needs in writing.

All children applied the following eight steps in studying words: (1) Pronounce each word correctly. (2) Look carefully at each part of the word as it is pronounced. (3) Say the letters in sequence. (4) Attempt to recall how the word looks and spell the word to oneself. (5) Check this attempt to recall. (6) Write the word. (7) Check this spelling attempt. (8) Repeat the above steps if necessary.

The same amount of time, seventy-five minutes each week, was devoted to the actual study of spelling in individualized and whole-class methods. A twenty-minute period was held each day. The additional five minutes allowed time for necessary classroom procedures that were not actual study time.

Due to possible negative influences on learning of the last period of the morning and last period of the afternoon, no spelling instruction was conducted during these two periods.

Workshops and training periods were held for teachers and, where necessary, children were given orientation periods on individual and whole-class procedures that did not constitute part of their regular spelling instruction period, thus reducing the possibility of lack of familiarity with materials and procedures having significant influence on the results of the study.

Collection of Data

The maturity of students influenced the kinds of experimental data which could be obtained from students in different grades. A fifty-word formal test was administered in the second grade in the fall and in the spring. In the third grade a one-hundred-word formal test was given in the fall and in the spring. A one-hundred-word formal test was administered to fourth, fifth, and sixth grade students in the fall and in the spring. Functional tests, consisting of five-hundred written words taken from structured essay-type and creative writing assignments, were also completed by fourth, fifth, and sixth grade students in the fall and spring.

In the third, fourth, fifth, and sixth grades, reading achievement data were obtained by administering the reading achievement section of the Iowa Tests of Basic Skills.

Treatment of Data

Data were grouped according to grades for comparison between the two spelling methods. Growth was determined by comparing fall and spring scores of both functional and formal tests in grades four through six, and fall and spring formal test scores in grades two and three. Analysis of covariance was used to test the significance of differences between the methods used.

Data obtained from students in grades three, four, five, and six were used to compare the two methods when the sample was divided into students with high, medium and low reading ability. Analysis of covariance was also used to test the significance of differences between these scores.

Findings

In the first-year study, answers were sought to the following questions:

1. In grades two through six in formal spelling, measured by formal spelling tests, which of the following methods is most efficient:
    a. the B.Y.U. individualized approach developed by the Brigham Young University Laboratory School staff?
    b. the whole-class approach?
2. In grades three through six in formal spelling, which of the two methods, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability?
3. In grades four through six in functional spelling, measured by counting the number of spelling errors in structured written exercises, which of the following methods of teaching spelling is most efficient:
    a. the B.Y.U. individualized approach?

b. the whole-class approach?

4. In grades four through six in functional spelling, which of the two methods, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability?

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Grades Two through Six

Analysis of covariance was used to test for differences between formal spelling performance of students who used the B.Y.U. individualized approach and those who used the whole-class approach. Each method was used in four classes of each grade, two through six. The grade, number who used the individualized approach, number who used the whole-class approach, adjusted mean of those who used the individualized approach, adjusted mean of those who used the whole-class approach, difference between adjusted means, the F ratios, and the significance of differences between the adjusted means are presented in Table 1.[1]

As shown in Table 1, in formal spelling performance significant differences were found in favor of the B.Y.U. individualized approach in the second grade. There were no significant differences in the performance of students who used the two approaches in grades three, four, five, and six.

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[1] The standard error of the adjusted mean which would normally appear in this table was not provided by the computer upon which the data of the first-year study were processed.

TABLE 1.--Formal spelling performance differences between students who used the B.Y.U. individualized approach and those who used the whole-class approach for grades two through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Adjusted Mean Whole-Class	Difference	F Ratio	Significance
2	110	110	27.860	31.495	3.635	10.920	<.01
3	97	109	57.210	55.841	-1.369	.360	>.05
4	129	113	44.839	44.547	- .292	.072	>.05
5	77	118	39.272	38.009	-1.263	.974	>.05
6	110	117	26.830	27.570	.740	.662	>.05

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Children with High, Medium, and Low Reading Ability in Grades Three through Six

Analysis of covariance was used to test for differences between formal spelling performance of students with high, medium, and low reading ability in grades three through six. The grade, number of students who used the individualized approach, number who used the whole-class approach, adjusted mean of those who used the individualized approach, the adjusted mean of those who used the whole-class approach, difference between the adjusted means, the F ratio and the significance of differences between the adjusted means are presented in Table 2.

As shown in Table 2, in formal spelling performance the F ratio was significant at the .01 level of confidence in favor of the B.Y.U. individualized approach for students of high reading ability in the third grade. The F ratio

TABLE 2.--Formal spelling performance differences of B.Y.U. individualized approach and the whole-class approach for children with high, medium, and low reading ability in grades three through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Adjusted Mean Whole-Class	Difference	F Ratio	Significance
High Reading Ability							
3	30	35	36.305	42.196	5.891	8.023	<.01
4	53	32	28.139	27.082	-1.057	.468	>.05
5	23	33	23.475	19.820	-3.655	2.359	>.05
6	37	39	12.286	14.268	1.982	4.094	<.05
Medium Reading Ability							
3	36	45	58.150	54.147	-4.003	1.213	>.05
4	47	43	44.865	44.753	- .112	.004	>.05
5	26	43	35.974	36.039	.065	.001	>.05
6	42	42	25.126	25.136	.010	.0001	>.05
Low Reading Ability							
3	31	29	78.407	72.737	-5.670	2.501	>.05
4	29	38	65.870	66.231	.361	.028	>.05
5	28	42	54.383	54.935	.552	.052	>.05
6	31	36	45.435	45.737	.302	.019	>.05

was significant at the .05 level of confidence for students of high reading ability in the sixth grade. There were no significant differences between the formal spelling performance of students of high reading ability who used the two approaches in grades four and five. There were no significant differences in the formal spelling performance of students of medium or low reading ability who used the two approaches in grades three through six.

Functional Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Grades Four through Six

Analysis of covariance was used to test for differences between functional spelling performance of students who used the B.Y.U. individualized approach and those who used the whole-class approach. Each method was used in four classes of each grade four, five, and six. The grade, number who used the individualized approach, number who used the whole class approach, adjusted mean of those who used the individualized approach, the adjusted mean of those who used the whole-class approach, difference between adjusted means, the F ratio, and the significance between the adjusted means are presented in Table 3.

As shown in Table 3 in functional spelling performance, the F ratio was significant at the .05 level of confidence in favor of the B.Y.U. individualized approach in grade four. There were no significant differences in functional spelling performance between students who used the two approaches in grades five and six.

TABLE 3.-- Functional spelling performance differences between students who used the B.Y.U. individualized approach and those who used the whole-class approach for grades four through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Adjusted Mean Whole-Class	Difference	F Ratio	Significance
4	129	113	30.325	34.771	4.446	4.362	$<.05$
5	77	118	24.077	26.306	2.29	1.990	$>.05$
6	110	117	22.540	22.398	- .142	.012	$>.05$

Functional Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Children with High, Medium, and Low Reading Ability in Grades Four through Six

Analysis of covariance was used to test for differences between functional spelling performance of students with high, medium, and low reading ability in grades four, five, and six. The grade, number of students who used the individualized approach, number who used the whole-class approach, adjusted mean of those who used the whole-class approach, difference between the adjusted means, the F ratio, and the significance between the adjusted means are presented in Table 4.

As shown in Table 4, the F ratios in functional spelling for those who used the individualized approach and the whole-class approach were too low to be significant between students of high, medium, and low reading ability in grades four, five, and six.

TABLE 4.--Functional spelling performance differences of B.Y.U. individualized approach and the whole-class approach for children with high, medium, and low reading ability in grades four through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Adjusted Mean Whole-Class	Difference	F Ratio	Significance
			High Reading Ability				
4	53	32	19.632	22.673	3.041	1.478	>.05
5	23	33	10.845	12.654	1.809	1.200	>.05
6	37	39	10.436	13.150	2.714	3.251	>.05
			Medium Reading Ability				
4	47	43	28.791	30.973	2.182	.509	>.05
5	26	43	21.401	24.129	2.728	1.592	>.05
6	42	42	19.716	17.260	-2.456	1.509	>.05
			Low Reading Ability				
4	29	38	49.115	51.728	2.613	.239	>.05
5	28	42	36.991	39.554	2.563	.558	>.05
6	31	36	40.817	38.408	2.409	.652	>.05

Summary of Findings

When student performance was tested between those who used the B.Y.U. individualized approach and those who used the whole-class approach during the first year, the findings were these:

1. In formal spelling for grades two through six, significant differences were found in favor of the B.Y.U. individualized approach in the second grade. There were no significant differences in the performance of students who used the two approaches in grades three, four, five, and six.

2. In formal spelling for grades three through six, significant differences were found in favor of the B.Y.U. individualized approach for students of high reading ability in the third grade. Significant differences were also found in favor of the B.Y.U. individualized approach for students of high reading ability in the sixth grade. There were no significant differences in the two approaches between the scores of students of high reading ability in grades four and five. There were no significant differences between the two approaches for students of medium and low reading ability in grades three through six.

3. In functional spelling for grades four, five, and six, significant differences were found in favor of the B.Y.U. individualized approach in grade four. There were no significant differences between student scores for the two approaches in grades five and six.

4. In functional spelling, there were no significant differences between the two approaches for students of high, medium, and low reading ability in grades four, five, and six.

5. Out of twenty-nine comparisons there were nineteen in favor of the B.Y.U. individualized approach, four of which were significant, and ten in favor of the whole-class approach, none of which were significant.

Conclusions

In analyzing the differences between the B.Y.U. individualized and whole-class approaches to spelling instruction, twenty-nine different groups of student scores were compared. Significant differences existed in four cases. In each case the difference was in favor of the B.Y.U. individualized approach. The findings of the first-year study led to the following conclusions:

1. The individualized approach is responsible for as much student progress as is the whole-class approach in all tested cases, and in some instances it is responsible for significantly more progress.

2. In formal spelling in grades two through six there are significant differences between the individualized and the whole-class approach in grade two in favor of the individualized approach. Reasons for differences in the second grade appear to be: (1) Some students in the individualized program were able to spend more time in formal spelling instruction. They could begin formal study when they were ready whereas all students in the whole-class approach were required to wait until the majority was ready. (2) Some children in the second grade are quite mature and when they are permitted to go at their own rates, they seem to be able to experience considerable progress as their spelling achievement catches up with their levels of maturity.

3. In formal spelling for students with high, medium, and low reading ability in grades three through six, there are significant differences in favor

of the individualized approach for students with high reading ability in grades three and six. There are no significant differences between the two approaches in grades four and five. It appears that all students with high reading ability benefit as much from the individualized approach in formal spelling as they do from the whole-class approach. They appear to benefit more from the individualized approach in the third and sixth grades.

4. In functional spelling in grades four, five, and six there are significant differences in grade four in favor of the B.Y.U. individualized approach. There are no significant differences in grades five and six. Fourth grade students characteristically make considerable development in the ability to express themselves in writing. It appears that the individualized approach to spelling is beneficial to students at this stage of growth in written expression.

5. In functional spelling for students in grades four, five, and six, there are no significant differences between the two approaches for students of high, medium, and low reading ability, indicating that in functional spelling students benefit as much from one approach as they do from the other when reading ability is considered.

6. Of the twenty-nine comparisons, nineteen were in favor of the individualized approach, four of which were significant. Ten were in favor of the whole-class approach, none of which were significant. Use of the methods over a longer period of time may produce significant differences.

II.

A COMPARISON OF THE RELATIVE EFFICIENCY OF TWO APPROACHES TO SPELLING INSTRUCTION IN GRADES TWO AND THREE AND FOUR APPROACHES TO SPELLING INSTRUCTION IN GRADES FOUR THROUGH SIX

(Second-Year Study)

General Purpose

The general purpose of this study was to compare the individualized and whole-class approaches to spelling instruction in grades two and three and to compare four different approaches to spelling instruction in grades four through six: the individualized method developed by the staff of the B.Y.U. Laboratory School, the whole-class method, the B.Y.U. individualized method used with the S.R.A. Spelling Laboratory, and the whole-class method used with the S.R.A. Spelling Laboratory.

Problem

In order to compare the efficiency of the individualized approach, the whole-class approach, the individualized approach in conjunction with the S.R.A. Spelling Laboratory, and the whole-class approach in conjunction with the S.R.A. Spelling Laboratory, answers to the following questions were sought:

1. In grades two and three in formal spelling, which of the following approaches is most efficient:
    a. the B.Y.U. individualized approach developed by the Brigham Young University Laboratory School staff?

   b. the whole-class approach?

2. In formal spelling achievement in grade three, which of the following approaches, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability:

   a. the B.Y.U. individualized approach?

   b. the whole-class approach?

3. In grades four, five, and six in formal spelling, which of the following approaches, if any, is most efficient:

   a. the B.Y.U. individualized approach?

   b. the whole-class approach?

   c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?

   d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?

4. In grades four, five, and six in formal spelling, which of the following approaches, if any, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability:

   a. the B.Y.U. individualized approach?

   b. the whole-class approach?

   c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?

   d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?

5. In grades four, five, and six in functional spelling, which of the following approaches, if any, is most efficient:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
    c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?
    d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?
6. In grades four, five, and six in functional spelling, which of the following approaches, if any, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
    c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?
    d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?

Definition of Terms

The terms *formal spelling*, *functional spelling*, *high reading achievement*, and *low reading achievement* were defined in the first-year report. These terms were also used in the second-year study as defined for the first-year study.

Description of Spelling Approaches

Individualized Approach

In the second year the words used, the students' procedures, and the teachers' procedures followed by the classes which used the individualized approach were identical with those followed in the first-year study. These procedures are described in detail in the first-year report.

Whole-Class Approach

The words and procedures used in the second year by the classes which used the whole-class approach were the same as those followed in the first-year study. These procedures are described in the first-year report.

Individualized Approach in Conjunction with the S.R.A. Spelling Laboratory

In the schools which used the S.R.A. Laboratory in conjunction with the individualized approach, only the fourth, fifth, and sixth grade classes used the laboratory. First, second, and third grade classes in these schools followed the same procedures as in those schools in which only the individualized approach was used.

S.R.A. Spelling Laboratory, Editions IIB, IIC and IIIA. The S.R.A. Spelling Laboratory is a multilevel, developmental spelling improvement program. Edition IIB is planned for use in the fifth grade but it has also been used successfully in the fourth grade and includes a wide range of words and skills designed to meet the needs of students at various levels. The IIC edition is designed for use in the sixth grade but it contains words and spelling skills needed by seventh grade students and it also reviews words and spelling skills needed by students who are working at no more than the third or fourth grade level of written expression. The IIB edition was used in the fourth and fifth grade classes in the study while the sixth grade classes used the IIC edition. The IIIA Laboratory, planned for junior high use, was also provided for accelerated students.

The S.R.A. Spelling Laboratory consists of diagnostic surveys, learning wheels, level check tests, answer keys, and student record books. It contains 1610 words and has as an objective the teaching of the spelling of these 1610 words and also the teaching of principles or "spelling ideas" that will aid the student in spelling many other words.

Diagnostic Achievement Surveys. Children who used the S.R.A. Laboratory took three diagnostic surveys: at the beginning of the study, after three weeks, and at the end of the twentieth week. The diagnostic test helped to isolate kinds of spelling errors made by each child. It also helped to establish the level of difficulty at which a child should work.

Study procedures. Children worked alone with the laboratory. They followed written instructions, scored and recorded their own work. The teacher worked with children who needed help, but he did not have an active teaching role with the material. The students determined which learning wheels they needed to study by consulting individual charts in their record books which were based on the diagnostic tests and pupil progress. The learning wheels are cards which contain exercises and instructions for learning particular spelling principles. A student followed the exercises and studied work given on the study wheels. He used the pages provided in his record book for study. When all the work had been completed for a level, the student took a level check test which indicated that he had satisfactorily passed the level or told him which wheels he needed to study to complete the level.

Students' and teachers' schedule. Students and teachers who used the individualized approach in conjunction with the S.R.A. Laboratory followed the same schedule used by those who used the individualized approach alone with the following exceptions:

Four-week orientation. An orientation period was held during the first four weeks of the study. During this time the recommended orientation procedures for the S.R.A. Laboratory were followed. The laboratory was used five days each week during this period of time.

Regular weekly schedule. After the four-week orientation period, the students began studying with the individualized approach. Partner tests, word study, and teacher tests were used three days a week. On the fourth day all students used the S.R.A. Laboratory. During the fifth day of every other week students used the S.R.A. Laboratory. The fifth day of alternate weeks was used as a variety day during which students learned spelling rules and generalizations, played spelling games, studied functional words, or worked in small groups or in whole-class activities as the teacher directed.

Whole-Class Approach in Conjunction with the S.R.A. Spelling Laboratory

In the schools which used the S.R.A. Laboratory in conjunction with the whole-class approach, only the fourth, fifth, and sixth grade classes used the S.R.A. Laboratory. Second and third grade classes followed the same procedures as those schools which used only the whole-class approach.

The procedures used with the S.R.A. Spelling Laboratory were the same for those in the whole-class approach as for the students who used it in conjunction with the individualized approach.

Students' and teachers' schedule. Students and teachers who used the whole-class approach in conjunction with the S.R.A. Laboratory used the following schedule:

Four-week orientation. An orientation period was held during the first four weeks of the study. During this time the recommended orientation procedures for the S.R.A. Laboratory were followed. The laboratory was used five days each week during this period of time.

Regular weekly schedule. After the orientation period, students began studying with the whole-class approach. The weekly schedule follows:

Monday. The teacher administered a test on the weekly list to the whole class. Procedures were the same as those used in the whole-class approach.

Tuesday. Students studied words missed on the Monday test and used the eight study steps as they did in the whole-class approach. Students who scored 100% on the Monday test were channeled into other activities.

Wednesday. The teacher administered a test on the weekly list to the entire class. The same procedures were followed as on Monday with the exception that someone other than the child corrected his paper.

Thursday. The S.R.A. Laboratory was used by all children.

Friday. Every other week students used the S.R.A. Laboratory. Friday of alternate weeks was used as a variety day during which students learned spelling rules and generalizations, played spelling games, or worked in small or whole-class activities as the teacher directed.

Grade Level Variations in Method

The differences in ability and maturity of students on various grade levels made variations in method of teaching within the B.Y.U. individualized and the whole-class approaches necessary. Method varied according to grade levels as described in detail in the first-year report.

Research Design

Sample

The sample for the second-year study included the same schools and classes which participated in the first-year study. The criteria for selection and the characteristics of the sample are described in detail in the first-year report.

Length of Study

The length of the study was twenty-eight weeks of actual spelling instruction beginning in the fall of 1963 and concluding in the spring of 1964.

Classroom Procedures

The classroom procedures followed during the second year were the same as those used the first year with the exceptions already noted. These modifications were necessary to enable classes to use the S.R.A. Spelling Laboratory with the individualized and whole-class methods.

The criteria for readiness, the eight study steps, actual daily spelling time, and orientation workshops used during both years are described in the report of the first-year study.

Collection of Data

The maturity of students influenced the kinds of experimental data which could be obtained from students in different grades. Test data obtained the second year were the same as during the first year and are described in the first-year report.

Treatment of Data

Data were grouped according to grades for comparison between the methods used. Comparisons between the individualized approach and the whole-class approach were made in grades two and three. Scores of third grade students were grouped according to reading ability to compare the performance of students with high reading ability, medium reading ability, and low reading ability. Differences in performance were determined by comparing fall and spring formal test scores. The significance of differences between the two methods was tested by analysis of covariance.

Both formal and functional test scores were used to compare the performance of students in the fourth, fifth, and sixth grades who used the individualized approach, the whole-class approach, the individualized approach with the S.R.A. Laboratory, and the whole-class approach with the S.R.A. Laboratory. Data from these students were also used to compare the four methods when the sample was divided into students with high, medium, and low reading ability. Differences were determined by comparing fall and spring formal and functional test scores. Analysis of covariance was used to test the significance of differences between the four methods. When significant differences were found, the Newman-Keuls Sequential Range Test was used to determine which of the four methods had produced the greatest differences.

Findings

In the second-year study answers were sought to the following questions:

1. In grades two and three in formal spelling, which of the following approaches is most efficient:
    a. the B.Y.U. individualized approach developed by the Brigham Young University Laboratory School staff?
    b. the whole-class approach?
2. In formal spelling achievement in grade three, which of the following approaches, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
3. In grades four, five, and six in formal spelling, which of the following approaches, if any is most efficient:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
    c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?
    d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?
4. In grades four, five, and six in formal spelling, which of the following approaches, if any, produces significantly greater

growth for children with high reading ability, with medium reading ability, and with low reading ability:

a. the B.Y.U. individualized approach?

b. the whole-class approach?

c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?

d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?

5. In grades four, five, and six in functional spelling, which of the following approaches, if any, is most efficient:

a. the B.Y.U. individualized approach?

b. the whole-class approach?

c. the B.Y.U. individualized approach in conjunction with the S.R.A. Spelling Laboratory?

d. the whole-class approach in conjunction with the S.R.A. Spelling Laboratory?

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Grades Two and Three

Analysis of covariance was used to test for differences between formal spelling performance of students who used the B.Y.U. individualized approach and those who used the whole-class approach. The B.Y.U. individualized approach was used in four classes in grade two and four classes of grade three. The whole-class approach was used in four classes of grade two and three classes of grade three. The grade, number who used the individualized approach, number who used the whole-class approach, adjusted mean of those who used the individualized approach, the standard error of the adjusted mean for the individualized approach, the adjusted mean of those who used the whole-class approach, the standard error of the adjusted mean of those who used the whole-class approach, difference between the adjusted means, the F ratios, and the significance of the differences between the adjusted means are presented in Table 5.

TABLE 5.--Formal spelling performance differences between students who used the B.Y.U. individualized approach and those who used the whole-class approach for grades two and three

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
2	97	115	30.976	.789	32.108	.725	1.132	1.116	$>.05$
3	101	95	59.365	.815	61.054	.840	1.689	2.076	$>.05$

As is shown in Table 5, in formal spelling performance there were no significant differences between the B.Y.U. individualized and whole-class approaches when the scores of second and third grade students were analyzed.

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Children with High, Medium, and Low Reading Ability in Grade Three

Analysis of covariance was used to test for differences between formal spelling performance of students with high, medium, and low reading ability in grade three. The reading ability, number of students who used the individualized approach, number who used the whole-class approach, adjusted mean of those who used the individualized approach, the standard error of the adjusted mean for those who used the individualized approach, the adjusted mean of those who used the whole-class approach, the standard error of the adjusted mean for those who used the whole-class approach, difference between the adjusted means, the F ratios, and the significance of the difference between the adjusted means are presented in Table 6.

TABLE 6.--Formal spelling performance differences of B.Y.U. individualized approach and the whole-class approach for children with high, medium, and low reading ability in grade three

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
				High Reading Ability					
3	39	23	37.691	1.271	41.090	1.657	3.399	2.636	>.05
				Medium Reading Ability					
3	37	33	60.378	1.213	61.789	1.285	1.411	.636	>.05
				Low Reading Ability					
3	25	39	79.170	1.212	80.224	.955	1.054	.436	>.05

As shown in Table 6, in formal spelling performance the F ratios indicated that there were no significant differences in the two approaches used between students of high, medium, or low reading ability in grade three.

Formal Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between formal spelling performance of students in grades four, five, and six. The grade, method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four methods are presented in Table 7.

TABLE 7.--Formal spelling performance differences between students who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
		Grade Four			
Ind.	55	49.262	1.089	.644	> .05
Wh. Cl.	63	50.404	1.004		
Ind. + SRA	52	48.417	1.110		
Wh. Cl. + SRA	63	49.007	1.004		
		Grade Five			
Ind.	52	35.863	.855	.291	> .05
Wh. Cl.	71	36.581	.733		
Ind. + SRA	52	36.117	.855		
Wh. Cl. + SRA	54	35.589	.841		
		Grade Six			
Ind.	56	25.121	.802	2.493	> .05
Wh. Cl.	71	27.522	.717		
Ind. + SRA	51	27.844	.840		
Wh. C. + SRA	60	27.518	.781		

As shown in Table 7, in formal spelling performance the F ratio between the four approaches used was too low to be significant in grades four, five, and six.

Formal Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children with High Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the formal spelling performance of students with high reading ability in grades four, five, and six. The grade, the method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four methods are presented in Table 8.

TABLE 8.--Formal spelling performance differences between students of high reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
			Grade Four		
Ind.	17	30.190	1.403	.986	>.05
Wh. Cl.	18	29.974	1.375		
Ind. + SRA	19	28.901	1.388		
Wh. Cl. + SRA	20	27.306	1.287		
			Grade Five		
Ind.	18	20.138	1.176	.878	>.05
Wh. Cl.	16	19.971	1.242		
Ind. + SRA	22	19.613	1.045		
Wh. Cl. + SRA	21	21.881	1.073		
			Grade Six		
Ind.	19	12.154	1.139	.624	>.05
Wh. Cl.	17	14.086	1.199		
Ind. + SRA	13	13.501	1.370		
Wh. Cl. + SRA	24	14.005	1.014		

As shown in Table 8 in formal spelling performance the F ratio was too low to be significant among the four methods for students with high reading ability in the fourth, fifth, and sixth grades.

Formal Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children with Medium Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the formal spelling performance of students with medium reading ability in grades four, five, and six. The grade, the method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four methods are presented in Table 9.

As shown in Table 9, in formal spelling performance the F ratio was significant at the .05 level of confidence in grade four and at the .01 level of confidence in grade six for students with medium reading ability.

In grade four the Newman-Keuls Sequential Range Test revealed significant differences at the .05 level of confidence between the B.Y.U. individualized approach plus the S.R.A. Laboratory and the whole-class approach plus S.R.A. Laboratory. The difference was in favor of the B.Y.U. individualized approach plus the S.R.A. Laboratory. Significant differences also existed between the B.Y.U. individualized approach plus S.R.A. Laboratory and the whole-class approach in favor of the B.Y.U. approach plus S.R.A. Laboratory.

In grade six the Newman-Keuls Sequential Range Test revealed significant differences at the .01 level of confidence between the B.Y.U. individualized approach and the B.Y.U. individualized approach plus S.R.A. Laboratory and

TABLE 9.--Formal spelling performance differences between students of medium reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
Grade Four					
Ind.	13	45.833	2.342	3.316	$<.05$
Wh. Cl.	29	51.005	1.548		
Ind. + SRA	18	44.157	1.954		
Wh. Cl. + SRA	24	50.466	1.694		
Grade Five					
Ind.	18	31.874	1.633	.171	$>.05$
Wh. Cl.	28	32.632	1.286		
Ind. + SRA	10	33.517	2.130		
Wh. Cl. + SRA	21	31.877	1.461		
Grade Six					
Ind.	20	22.115	1.395	4.151	$<.01$
Wh. Cl.	24	26.326	1.252		
Ind. + SRA	27	28.202	1.194		
Wh. Cl. + SRA	21	27.735	1.339		

between the B.Y.U. individualized approach and the whole-class approach plus the S.R.A. Laboratory. The difference was in favor of the B.Y.U. individualized approach in both cases. Significant differences at the .05 level of confidence were found between the B.Y.U. individualized approach and the whole-class approach in favor of the B.Y.U. individualized approach. No other significant differences were found between the methods.

Formal Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children with Low Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the formal spelling performance of students with low reading ability in grades four, five, and six. The grade, method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four methods are presented in Table 10.

TABLE 10.--Formal spelling performance differences between students of low reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
			Grade Four		
Ind.	25	69.246	1.639	.425	> .05
Wh. Cl.	16	72.039	2.031		
Ind. + SRA	15	70.374	2.081		
Wh. Cl. + SRA	19	69.558	1.859		
			Grade Five		
Ind.	16	56.068	1.510	.242	> .05
Wh. Cl.	27	56.619	1.166		
Ind. + SRA	20	55.624	1.349		
Wh. Cl. + SRA	12	54.895	1.796		
			Grade Six		
Ind.	17	40.279	1.522	.616	> .05
Wh. Cl.	30	41.894	1.137		
Ind. + SRA	11	43.326	1.878		
Wh. Cl. + SRA	15	40.922	1.633		

As shown in Table 10, in formal spelling performance the F ratio was too low to be significant among the four methods for students with low reading ability in grades four, five, and six.

Functional Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between functional spelling performance of students in grades four, five, and six. The method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four approaches are presented in Table 11.

TABLE 11.--Functional spelling performance differences between students who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
Grade Four					
Ind.	55	38.140	1.880	3.784	<.05
Wh. Cl.	63	35.234	1.751		
Ind. + SRA	52	30.108	1.937		
Wh. Cl. + SRA	63	37.824	1.752		
Grade Five					
Ind.	52	28.334	1.237	3.305	<.05
Wh. Cl.	71	27.755	1.067		
Ind. + SRA	52	23.776	1.232		
Wh. Cl. + SRA	74	25.031	1.217		
Grade Six					
Ind.	56	22.087	1.072	1.524	>.05
Wh. Cl.	71	24.050	.973		
Ind. + SRA	51	21.312	1.123		
Wh. Cl. + SRA	60	21.445	1.044		

As shown in Table 11, in functional spelling performance the F ratio was significant at the .05 level of confidence between the four methods used in grades four and five. There were no significant differences in grade six.

In grade four the Newman-Keuls Sequential Range Test revealed significant differences in favor of the B.Y.U. individualized approach plus the S.R.A. Laboratory over each of the other three approaches. No other significant differences were found between the methods used.

In grade five the Newman-Keuls Sequential Range Test revealed significant differences in favor of the B.Y.U. individualized approach plus the S.R.A. Laboratory over the B.Y.U. individualized and whole-class approaches.

Functional Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children of High Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the functional spelling performance of students with high reading ability in grades four, five, and six. The grade, method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of differences between the adjusted means for the four methods are presented in Table 12.

As shown in Table 12, in functional spelling performance the F ratio was too low to be significant among the four methods for students with high reading ability in grades four, five, and six.

TABLE 12.--Functional spelling performance differences between students with high reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
Grade Four					
Ind.	17	21.670	2.332	.987	>.05
Wh. Cl.	18	25.533	2.266		
Ind. + SRA	19	21.090	2.310		
Wh. Cl. + SRA	20	20.716	2.199		
Grade Five					
Ind.	18	16.839	1.687	.612	>.05
Wh. Cl.	16	17.894	1.785		
Ind. + SRA	22	15.451	1.500		
Wh. Cl. + SRA	21	18.080	1.534		
Grade Six					
Ind.	19	10.843	1.314	.484	>.05
Wh. Cl.	17	12.819	1.430		
Ind. + SRA	13	10.524	1.592		
Wh. Cl. + SRA	24	11.428	1.183		

Functional Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children of Medium Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the functional spelling performance of students with medium reading ability in grades four, five, and six. The method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios, and the significance of the differences between the adjusted means for the four methods are presented in Table 13.

TABLE 13.--Functional spelling performance differences between students with medium reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
Grade Four					
Ind.	13	40.210	3.941	2.647	> .05
Wh. Cl.	29	31.826	2.634		
Ind. + SRA	18	27.115	3.348		
Wh. Cl. + SRA	24	36.427	2.895		
Grade Five					
Ind.	18	23.860	2.076	.116	> .05
Wh. Cl.	28	23.128	1.672		
Ind. + SRA	10	24.947	2.786		
Wh. Cl. + SRA	21	23.308	1.918		
Grade Six					
Ind.	20	19.677	1.424	1.766	> .05
Wh. Cl.	24	23.734	1.285		
Ind. + SRA	27	20.774	1.209		
Wh. Cl. + SRA	21	22.332	1.367		

As shown in Table 13, in functional spelling performance the F ratio was too low to be significant among the four methods for students with medium reading ability in the fourth, fifth, and sixth grades.

Functional Spelling Comparison of B.Y.U. Individualized Approach, Whole-Class Approach, B.Y.U. Individualized Approach plus S.R.A. Laboratory, and Whole-Class Approach plus S.R.A. Laboratory for Children of Low Reading Ability in Grades Four, Five, and Six

Analysis of covariance was used to test for differences between the functional spelling performance of students with low reading ability in grades four, five, and six. The method, number who used the various methods, adjusted means, standard errors of the adjusted means, the F ratios and the significance of the differences between the adjusted means for the four methods are presented in Table 14.

TABLE 14.--Functional spelling performance differences between students with low reading ability who used the B.Y.U. individualized approach, whole-class approach, B.Y.U. individualized approach plus S.R.A. Laboratory, and whole-class approach plus S.R.A. Laboratory in grades four through six

Method	Number	Adjusted Mean	Standard Error Adjusted Mean	F Ratio	Significance
			Grade Four		
Ind.	25	51.542	3.185	2.321	> .05
Wh. Cl.	16	50.747	3.978		
Ind. + SRA	15	42.398	4.090		
Wh. Cl. + SRA	19	56.818	3.615		
			Grade Five		
Ind.	16	44.685	2.487	7.700	< .01**
Wh. Cl.	27	42.712	1.975		
Ind. + SRA	20	32.847	2.185		
Wh. Cl. + SRA	12	31.823	2.891		
			Grade Six		
Ind.	17	35.650	2.567	1.160	> .05
Wh. Cl.	30	35.670	1.979		
Ind. + SRA	11	33.592	3.250		
Wh. Cl. + SRA	15	29.622	2.779		

As shown in Table 14, in functional spelling performance the F ratio was significant at the .01 level of confidence between the four methods used in the fifth grade.

In the fifth grade the Newman-Keuls Sequential Range Test revealed significant differences at the .01 level of confidence in favor of the whole-class approach plus the S.R.A. Laboratory over the whole-class and B.Y.U. individualized approaches and in favor of the B.Y.U. individualized approach plus the S.R.A. Laboratory over the whole-class and B.Y.U. individualized approaches.

No other significant differences were found between the methods used.

Summary of Findings

When comparisons were made between the individualized and whole-class methods in grades two and three and between the B.Y.U. individualized method, the whole-class method, the B.Y.U. individualized method plus the S.R.A. Laboratory, and the whole-class method plus the S.R.A. Laboratory in grades four through six, the following information was found:

1. There were no significant differences between the B.Y.U. individualized and whole-class methods in formal spelling performance in grades two and three.

2. There were no significant differences between the B.Y.U. individualized and whole-class methods in formal spelling performance when the scores of third grade students were divided into those with high, medium, and low reading ability.

3. There were no significant differences between the formal spelling performance of students in grade four, five, or six when the B.Y.U. individualized method, the whole-class method, the B.Y.U. individualized method plus the S.R.A. Laboratory, and the whole-class method plus the S.R.A. Laboratory were compared.

4. There were no significant differences in the comparisons between the four methods when the formal spelling scores of students with high

reading ability in grades four, five, and six were analyzed.

5. When the formal spelling performance of students with medium reading ability was analyzed, there were no significant differences in grade five but significant differences existed in grades four and six. In grade four the students who used the B.Y.U. individualized method plus the S.R.A. Laboratory had significantly fewer errors than students who used the whole-class method and the whole-class method plus the S.R.A. Laboratory. In the sixth grade, students who used the B.Y.U. individualized method had significantly better scores than students who used any of the other three methods.

6. There were no significant differences when the formal spelling performance of students with low reading achievement in grades four, five, and six was analyzed.

7. When functional spelling performance of students who used the four methods was compared, there were no significant differences in grade six. Significant differences were found in grades four and five. In grade four students who used the B.Y.U. individualized method plus the S.R.A. Laboratory achieved significantly better scores than those who used any of the other three methods. In the fifth grade students who used the B.Y.U. individualized method plus the S.R.A. Laboratory showed significantly fewer errors than students who used the individualized method or the whole-class method.

8. There were no significant differences in functional spelling performance when the scores of students with high reading achievement in grades four, five, and six were compared.

9. There were no significant differences between the four methods when functional test scores of students with medium reading ability in grades four,

five, and six were compared.

10. When the functional spelling scores of students with low reading ability were compared, there were no significant differences between the four methods in grades four and six. In grade five, students who used the whole-class method plus the S.R.A. Laboratory had fewer errors than students who used the B.Y.U. individualized and whole-class methods. Also, students who used the B.Y.U. individualized method plus the S.R.A. Laboratory had fewer errors than students who used the B.Y.U. individualized and whole-class approaches.

Each of the four methods was compared with every other method twenty-four times. Five additional comparisons were made between the individualized and whole-class approaches.

Of the twenty-nine comparisons made between the whole-class and individualized approaches, twenty were in favor of the individualized approach, one of which was significant. Nine were in favor of the whole-class approach, none of which were significant. There were significant differences in favor of the individualized approach plus the S.R.A. Laboratory over the whole-class approach in four instances, over the whole-class plus the S.R.A. Laboratory in two instances, and over the individualized approach in three instances. Significant differences were found in favor of the individualized approach over each of the other methods in one instance each. Significant differences were found in favor of the whole-class approach plus the S.R.A. Laboratory over the individualized approach and whole-class approach in one instance for each.

Conclusions

The findings of the second-year study led to the following conclusions:

1. Fourth-grade students with medium reading achievement who used the individualized method plus the S.R.A. Laboratory made greater progress in formal spelling than did students who used the whole-class method and the whole-class method plus the S.R.A. Laboratory. A program of individual progress with systematic development of spelling principles on an individual basis appears to be valuable for students at the fourth grade level who read at about the middle level for their grade.

2. In the sixth grade, greater growth was made by students with medium reading ability who used the individualized method than students who used any of the other three approaches. For sixth grade students who read at about the middle level for the sixth grade a spelling program permitting individual progress appears to be most valuable. Apparently the addition of a program of instruction in spelling principles is less valuable at this level than at the fourth grade level for students with medium reading ability.

3. Except in the instances noted above, it appears that the four methods have little effect on the differences in formal spelling performance of elementary school students.

4. The functional spelling performance of students appears to be influenced by the spelling method used in the fourth grade. At this level the individualized approach in conjunction with the S.R.A. Laboratory produces significantly greater growth than any of the other three methods. Fourth grade is a year in which the written work of students develops in both

quality and quantity. A program which provides an opportunity for individual progress with added individual help in spelling principles appears to be valuable for growth in functional spelling by fourth grade students.

5. In the fifth grade those who used the individualized method plus the S.R.A. Laboratory made greater progress than the students who used the individualized method or whole-class method alone. It was concluded that the addition of a systematic program of individual instruction in spelling principles increases the functional spelling growth of students who use the individualied and whole-class programs in fifth grade.

6. Fifth grade students with low reading ability who used the individualized method plus the S.R.A. Laboratory achieved greater growth in spelling than fifth grade students with low reading ability who used either the whole-class method or the individualized method. Students in the fifth grade with low reading achievement who used the whole-class method plus the S.R.A. Laboratory made greater progress than fifth grade students with low reading achievement who used either the individualized method or the whole-class method. The addition of the S.R.A. Spelling Laboratory to both the whole-class and individualized methods appears to be valuable for improving functional spelling for students with low reading achievement in the fifth grade.

7. Although exceptions were found in the formal spelling progress of students with medium reading ability in grades four and six and in functional spelling growth of students with low reading ability in grade five, reading ability generally has little effect on which of the four spelling methods produces the greatest student progress.

8. No clear-cut and positive advantage was found for any of the

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four methods, but the significant differences that did exist suggest that the addition of a systematic program for the development of spelling principles, such as the S.R.A. Laboratory, to the whole-class or the individualized approach adds strength to either method. This appeared to be true particularly at the fourth and fifth grade levels.

III.

A TWO-YEAR LONGITUDINAL STUDY OF INDIVIDUALIZED AND WHOLE-CLASS APPROACHES TO SPELLING INSTRUCTION IN GRADES TWO THROUGH SIX

General Purpose

The general purpose of this study was to determine if the individualized approach to spelling instruction is more efficient than the whole-class approach over a two-year period of time in the elementary grades.

Problem

In order to compare the efficiency of the individualized approach and the whole-class approach during a two-year period, answers to the following questions were sought:

1. In formal spelling for students who are in grades three, four, five, and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during a two-year period of time:
    a. the B.Y.U. individualized approach developed by the Brigham Young University Laboratory School staff?
    b. the whole-class approach?
2. In formal spelling for students who are in grades three, four, five, and six during the second year, which of the two approaches, if either, produces significantly greater growth for children

with high reading ability, with medium reading ability, and with low reading ability during a two-year period of time?

3. In functional spelling for students who are in grades five and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during a two-year period of time:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?
4. In functional spelling for students who are in grades five and six during the second year, which of the two approaches, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability during a two-year period of time?
5. In formal spelling for students in the third, fourth, fifth, and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the B.Y.U. individualized approach and during the second year they use the B.Y.U. individualized approach?
6. In functional spelling for students in the fifth and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the B.Y.U. individualized approach and during the second year they use the B.Y.U. individualized approach?
7. In formal spelling for students in the third, fourth, fifth, and

sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the whole-class approach and during the second year they use the whole-class approach?

8. In functional spelling for students in the fifth and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the whole-class approach and during the second year they use the whole-class approach?

9. In formal spelling for students who are in grades three, four, five, and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during the second year they use the two approaches:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?

10. In functional spelling for students who are in grades five and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during the second year they use the two approaches:
    a. the B.Y.U. individualized approach?
    b. the whole-class approach?

Definition of Terms

The terms formal spelling, functional spelling, high reading achievement, medium reading achievement, and low reading achievement were used in the longitudinal study in the same way these terms were defined and described in the first-year report.

Description of Spelling Methods

The spelling words, students' procedures, and teachers' procedures used in the individualized and whole-class methods in the longitudinal study were the same as those used in the first-year study and are described in detail in the first-year report. Grade level variations and classroom procedures were also the same as reported in the description of the first-year study.

Research Design

Sample

The sample used for the two-year longitudinal study included those students who were in the third, fourth, fifth, and sixth grades during the second year. Students who were included used the same method, either the individualized or whole-class approach, during both years of the study. In the third grade there were three classes who used the whole-class approach and four who used the individualized approach. Data were not available for one of the original urban third grade classes that used the whole-class approach. Two classes of each grade, four through six, used the individualized method. One class in each grade was in an urban community of over 25,000 population and one class in each grade came from a rural community with a population under 12,000. Two classes, one rural and one urban, of each grade, four through six, used the whole-class method.

Length of Study

The length of the study was two twenty-eight week periods during the school years 1962-1963 and 1963-1964. The two-year longitudinal study began in the fall of 1962 and concluded in the spring of 1964.

Collection of Data

Data for the two-year study were obtained from the formal test scores of students in the second-year third, fourth, fifth, and sixth grade classes who had used the same method for two years. Functional spelling scores of students in the second-year fifth and sixth grade classes who used the same method during both years were also included. Fall and spring formal and functional test scores for both years were used. Information obtained from the reading achievement section of the Iowa Tests of Basic Skills which was administered during the first year in grades four, five, and six, and in the second year in grade three was used to divide the sample into high, medium, and low reading achievement groups.

Treatment of Data

At the conclusion of the two-year longitudinal study, growth was measured by computing the differences between fall and spring scores on both formal and functional tests. The differences between the results of fall, 1962 tests and spring, 1964 tests were also computed.

Data were grouped according to grades and according to high, medium, and low reading achievement for comparison between the two methods.

Comparisons were also made between the spelling growth of students during the first year they used the individualized method and their growth during the second year they used this approach. A similar comparison was made between the first and second year growth of students who used each method.

Findings

Answers to the following questions were sought in the two-year longitudinal study which compared the individualized and whole-class approaches to spelling instruction:

1. In formal spelling, measured by a fifty-word spelling test in second grade and by a hundred-word spelling test in grades three through six, for students who are in the third, fourth, fifth, and sixth grades during the second year, which of the following approaches, if either, produces significantly greater growth for children during a two-year period:
   a. the B.Y.U. individualized approach?
   b. the whole-class approach?
2. In formal spelling for students who are in grades three, four, five, and six during the second year, which of the two approaches, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability during a two-year period of time?
3. In functional spelling, measured by recording spelling errors in structured written exercises of students in the fifth and

sixth grades during the second year, which of the following approaches, if either, produces significantly greater growth for children during a two-year period of time:

a. the B.Y.U. individualized approach?

b. the whole-class approach?

4. In functional spelling for students who are in grades five and six during the second year, which of the two approaches, if either, produces significantly greater growth for children with high reading ability, with medium reading ability, and with low reading ability during a two-year period of time?

5. In formal spelling for students in the third, fourth, fifth, and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the B.Y.U. individualized approach and during the second year they use the B.Y.U. individualized approach?

6. In functional spelling for students in the fifth and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the B.Y.U. individualized approach and during the second year they use the B.Y.U. individualized approach?

7. In formal spelling for students in the third, fourth, fifth, and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the whole-class approach and during the second year they use the whole-class approach?

8. In functional spelling for students in the fifth and sixth grades during the second year, what significant differences exist, if any, between the spelling growth of children during the first year they use the whole-class approach and during the second year they use the whole-class approach?

9. In formal spelling for students who are in grades three, four, five, and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during the second year they use the two approaches:
    - a. the B.Y.U. individualized approach?
    - b. the whole-class approach?

10. In functional spelling for students who are in grades five and six during the second year, which of the following approaches, if either, produces significantly greater growth for children during the second year they use the two approaches:
    - a. the B.Y.U. individualized approach?
    - b. the whole-class approach?

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Grades Two through Six

The performance of students in formal spelling from the beginning to the end of the two-year period is presented in Table 15. A comparison between the two methods is made by using analysis of covariance. The grades listed represent students who were in the second grade during 1962-63 and in the third grade during 1963-64 (identified as grades 2-3), students who were in the third grade during 1962-63 and in the fourth grade during 1963-64 (grades 3-4), students who were in the fourth grade during 1962-63 and in the fifth grade during 1963-64 (grades 4-5), and students who were in the fifth grade during 1962-63 and in the sixth grade during 1963-64 (grades 5-6).

The table indicates the number in each grade who used the two approaches, the adjusted means, standard errors of the adjusted means, the differences between adjusted means, the F ratios, and the significance of differences.

TABLE 15.--Formal spelling performance differences between students who used the B.Y.U. individualized approach and those who used the whole-class approach over a two-year period for grades two through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
2-3	78	63	59.573	1.997	63.593	2.222	4.020	1.810	>.05
3-4	23	52	43.389	2.350	52.655	1.546	9.266	10.594	<.01
4-5	36	52	35.462	1.788	42.084	1.484	6.622	8.032	<.01
5-6	46	61	28.695	1.272	30.476	1.104	1.781	1.115	>.05

As shown in Table 15 there were significant differences in the formal spelling performance of students in grades 3-4 and 4-5 which were significant at the .01 level of confidence. In each case the difference was in favor of the individualized approach. There were no significant differences in the performance of students in grades 2-3 and 5-6.

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Children with High, Medium, and Low Reading Ability for Grades Two through Six

A comparison of formal spelling performance between the individualized and whole-class approaches when the sample was divided into high, medium, and low reading ability groups is presented in Table 16. Analysis of covariance was used to test the significance of differences. The number of students in each grade of each reading ability in each of the two approaches is indicated. The table also lists the adjusted mean and standard error of the adjusted mean for each reading ability group in each approach, the differences between means, the F ratios, and the significance of differences.

TABLE 16.--Formal spelling performance differences between students of high, medium, and low reading ability who used the B.Y.U. individualized approach and those who used the whole-class approach over a two-year period for grades two through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
High Reading Ability									
2-3	25	12	35.041	2.509	41.998	3.644	6.957	2.434	>.05
3-4	5	15	35.253	4.351	39.649	2.509	4.396	.765	>.05
4-5	10	15	14.139	1.719	21.841	1.400	7.702	11.917	<.01
5-6	19	12	14.040	1.500	15.520	1.890	1.480	.375	>.05
Medium Reading Ability									
2-3	31	25	60.475	2.956	62.211	3.309	1.736	.146	>.05
3-4	10	26	36.499	3.111	48.654	1.895	12.155	10.789	<.01
4-5	17	18	32.574	2.631	42.236	2.550	9.662	6.343	<.05
5-6	11	21	21.875	2.069	26.113	1.492	4.238	2.730	>.05
Low Reading Ability									
2-3	22	26	83.245	1.891	77.370	1.729	-5.875	4.907	<.05
3-4	8	11	63.769	2.876	74.986	2.448	11.217	8.721	<.01
4-5	9	19	59.871	4.108	60.166	2.820	.295	.003	>.05
5-6	16	28	42.606	2.430	44.832	1.810	2.226	.515	>.05

Table 16 indicates that when the formal spelling scores of students with high reading ability were compared there was a difference in favor of the individualized approach in grade 4-5 which was significant at the .01 level of confidence. There were no significant differences in grades 2-3, 3-4, or 5-6.

The performance of students with medium reading ability showed a difference which was significant at the .01 level in grade 3-4 and a difference which was significant at the .05 level in grade 4-5. In both cases the difference was in favor of the individualized approach. There were no significant differences in grade 2-3 or grade 5-6.

In the low reading ability groups there was a difference which was significant at the .05 level in favor of the whole-class approach in grade 2-3. In grade 3-4 a difference which was significant at the .01 level was found in favor of the individualized approach. No significant differences were found in grade 4-5 or grade 5-6.

Functional Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Grades Four through Six

The functional spelling performance of students who were in the fifth and sixth grades during the second year of the study is reported in Table 17. The grades are identified as grade 4-5 (students who were in the fourth grade during 1962-63 and in the fifth grade during 1963-64) and grade 5-6 (students who were in the fifth grade during 1962-63 and in the sixth grade during 1963-64). A comparison was made between the number of spelling errors made on assigned written exercises at the beginning of the first year and errors made on similar assignments at the end of the second year using analysis of covariance. The number of students in each grade who used each of the two approaches, the adjusted means, the standard errors of the adjusted means, the difference between adjusted means, the F ratios, and the significance of differences are reported.

TABLE 17.--Functional spelling performance differences between students who used the B.Y.U. individualized approach and those who used the whole-class approach over a two-year period for grades four through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Who. Cl.	Difference	F Ratio	Significance
4-5	36	52	23.265	2.720	34.009	2.263	10.734	9.218	<.01
5-6	46	61	23.941	1.658	29.094	1.438	5.153	5.479	<.05

There were significant differences between the functional spelling performance of students who used the individualized approach and students who used the whole-class approach in both grade 4-5 and grade 5-6. The difference in grade 4-5 was significant at the .01 level of confidence and at the .05 level in grade 5-6. In both cases the difference was in favor of the individualized approach.

Functional Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach for Children with High, Medium, and Low Reading Ability for Grades Four through Six

A comparison of the functional spelling performance of students of high, medium, and low reading ability who used the individualized and whole-class approaches is presented in Table 18. Analysis of covariance was used to test the significance of differences. The number of students in each grade of each reading ability who used each of the two approaches is reported. The adjusted mean and standard error of the adjusted mean for each reading ability group in each approach, the differences between means, the F ratios, and the significance of differences are also given.

TABLE 18.--Functional spelling performance differences between students of high, medium, and low reading ability who used the B.Y.U. individualized approach and those who used the whole-class approach over a two-year period for grades four through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
High Reading Ability									
4-5	10	15	12.642	2.415	16.505	1.965	3.863	1.515	>.05
5-6	19	12	10.959	1.834	17.566	2.312	6.607	4.971	<.05
Medium Reading Ability									
4-5	17	18	18.850	4.205	30.475	4.082	11.623	3.780	>.05
5-6	11	21	20.596	2.755	25.545	1.983	4.949	2.093	>.05
Low Reading Ability									
4-5	9	19	46.146	5.247	49.878	3.605	3.832	.342	>.05
5-6	16	28	36.765	3.437	39.491	2.597	2.726	.400	>.05

Table 18 indicates that there was a significant difference in the functional spelling performance of students with high reading ability in grade 5-6. This difference was in favor of the individualized approach and was significant at the .05 level of confidence. There were no other significant differences when the functional spelling performance of students who used the two methods was compared according to reading ability.

Formal Spelling Comparison between the First and Second Years the B.Y.U. Individualized Approach Was Used for Grades Three through Six

Analysis of covariance was used to make a comparison between the formal spelling performance of students who used the B.Y.U. individualized approach in grades 3-4, 4-5, and 5-6 during the first year they used this spelling method and their performance during the second year as presented in Table 19. The number of students in each grade, the adjusted mean for the first year (1962-63) the adjusted mean for the second year (1963-64) the difference between these means, the standard error of the adjusted means, the F ratios, and the significance of differences are indicated.

TABLE 19.--Formal spelling performance differences between the first and second years the B.Y.U. individualized approach was used for grades three through six

Grade	Number	Adjusted Mean First Year	Standard Error Adj. Mean First Year	Adjusted Mean Second Year	Standard Error Adj. Mean Second Year	Difference	F Ratio	Significance
3-4	23	54.626	2.020	58.069	2.020	3.443	1.349	$>.05$
4-5	36	42.846	1.320	48.348	1.320	5.501	7.993	$<.01$
5-6	46	31.466	1.007	33.187	1.007	1.721	1.400	$>.05$

As shown in Table 19, there was a difference which was significant at the .01 level of confidence between the first-year formal spelling performance and the second-year formal spelling performance of students in grade 4-5. This difference was in favor of the first-year performance of students. There were no significant differences in the formal spelling performance of students in grades 3-4 and 5-6.

Functional Spelling Comparison between the First and Second Years the B.Y.U. Individualized Approach Was Used for Grades Four through Six

Table 20 presents a comparison between the functional spelling performance of students during the first year they used the individualized approach and the second year they used the individualized approach. The number of students in each grade, the adjusted mean and standard error of the adjusted mean for the first year (1962-63), the adjusted mean and standard error of the adjusted mean for the second year (1963-64), the differences between means, the F ratios, and significance of differences are given.

TABLE 20.--Functional spelling performance differences between the first and second years the B.Y.U. individualized approach was used for grades four through six

Grade	Number	Adjusted Mean First Year	Standard Error Adj. Mean First Year	Adjusted Mean Second Year	Standard Error Adj. Mean Second Year	Diff-erence	F Ratio	Sig-nifi-cance
4-5	36	34.144	2.709	26.884	2.709	7.260	3.507	> .05
5-6	46	19.756	1.151	23.287	1.151	3.531	4.093	< .05

Table 6 indicates that there was a difference between the first and second year functional spelling performance in grade 5-6 which was significant at the .05 level of confidence in favor of the first-year performance of students. There was no significant difference between the first and second year functional spelling performance of students in grade 4-5.

Formal Spelling Comparison between the First and Second Years the Whole-Class Approach Was Used by Students in Grades Three through Six

A comparison between the formal spelling performance of students during the first year they used the whole-class spelling approach and the second year they used the approach is made in Table 21. The scores of students who were in the third grade during the first year of the study and in the fourth grade during the second year (grade 3-4), students who were in the fourth grade during the first year and in the fifth grade during the second year (grade 4-5), and students who were in the fifth grade during the first year and in the sixth grade during the second year (grade 5-6) were included. The significance of differences was tested by analysis of covariance. The number of students in each grade, the adjusted means for 1962-63 with the standard error of the adjusted means, the adjusted means for 1963-64 with the standard error of the adjusted means, the differences between means, the F ratios, and the significance of differences are included in the table.

TABLE 21.--Formal spelling performance differences between the first and second years the whole-class approach was used for grades three through six

Grade	Number	Adjusted Mean First Year	Standard Error Adj. Mean First Year	Adjusted Mean Second Year	Standard Error Adj. Mean Second Year	Difference	F Ratio	Significance
3-4	52	51.361	1.396	54.255	1.396	2.894	2.084	> .05
4-5	52	42.010	.991	46.047	.991	3.037	8.011	< .01
5-6	61	33.850	1.860	36.691	1.860	2.841	2.722	> .05

As indicated in Table 21, there was a significant difference in the formal spelling performance of students in grade 4-5 between the first year and second year the approach was used. This difference was significant at the .01 level of confidence and was in favor of the first-year performance of students. There were no significant differences between the formal spelling performance of students during the first and second years the whole-class approach was used in grade 3-4 or in grade 5-6.

Functional Spelling Comparison between the First and Second Years the Whole-Class Approach Was Used by Students in Grades Four through Six

The performance of students in grade 4-5 and in grade 5-6 in functional spelling during the first year the whole-class approach was used and their functional spelling performance during the second year this approach was used are compared in Table 22. Analysis of covariance was used to test the significance of differences. The number of students in each grade, the adjusted mean and standard error of the adjusted mean for the first year, the adjusted mean and standard error of the adjusted mean for the second year, the differences between adjusted means, the F ratios, and significance of differences are indicated.

TABLE 22.--Functional spelling performance differences between the first and second years the whole-class approach was used for grades four through six

Grade	Number	Adjusted Mean First Year	Standard Error Adj. Mean First Year	Adjusted Mean Second Year	Standard Error Adj. Mean Second Year	Difference	F Ratio	Significance
4-5	52	36.533	1.874	34.947	1.874	-1.586	.357	>.05
5-6	61	29.040	1.314	30.648	1.314	1.608	.749	>.05

Table 22 shows that there were no significant differences between the first-year functional spelling performance and the second-year functional spelling performance of students who used the whole-class approach in either grade 4-5 or grade 5-6.

Formal Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach During the Second Year for Grades Two through Six

A comparison between the formal spelling performance of students during the second year they used the individualized approach and the whole-class approach is made in Table 23. Students who were in the second grade during the first year and in the third grade during the second year (grade 2-3), students who were in third grade during the first year and in the fourth grade during the second year (grade 3-4), students who were in the fourth grade during the first year and in fifth grade during the second year (grade 4-5) and students who were in the fifth grade during the first year and in sixth grade during the second year (grade 5-6) were included. The number in each grade who used each approach, the adjusted means and standard error of the adjusted means for each approach, the differences between means, the F ratios, and the significance of differences are reported.

TABLE 23.--Formal spelling performance differences between the B.Y.U. individualized approach and the whole-class approach during the second year each approach was used for grades two through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
2-3	78	63	61.075	.899	61.733	1.000	.658	.239	>.05
3-4	23	52	48.220	1.410	50.518	.937	2.298	1.841	>.05
4-5	36	52	38.149	1.102	40.224	.917	2.075	2.092	>.05
5-6	46	61	29.214	.951	30.085	.827	.871	.474	>.05

Table 23 indicates there were no significant differences in the formal spelling performance of students during the second year they used the individualized and whole-class approaches.

Functional Spelling Comparison of B.Y.U. Individualized Approach and the Whole-Class Approach during the Second Year for Grades Four through Six

The functional spelling performance of students during the second year they used the individualized approach and the whole-class approach are compared in Table 24. Analysis of covariance was used to test the significance of differences. The students included were in the fourth, fifth, and sixth grades during the second year. The table includes the number in each grade who used each spelling approach, the adjusted means and standard errors of the adjusted means for both individualized and whole-class groups, the differences between these means, the F ratios, and the significance of differences.

TABLE 24.--Functional spelling performance differences between the B.Y.U. individualized approach and the whole-class approach during the second year each approach was used for grades four through six

Grade	Number Individualized	Number Whole-Class	Adjusted Mean Individualized	Standard Error Adj. Mean Indiv.	Adjusted Mean Whole-Class	Standard Error Adj. Mean Wh. Cl.	Difference	F Ratio	Significance
3-4	23	52	38.075	2.695	35.332	1.791	-2.742	.718	>.05
4-5	36	52	27.188	1.648	31.293	1.369	4.105	3.643	>.05
5-6	46	61	25.419	1.157	27.979	1.002	2.560	2.754	>.05

Table 24 indicates that there were no significant differences in the functional spelling performance of students in the individualized and whole-class approaches during the second year the approaches were used.

Summary of Findings

When student performance was tested between those who used the B.Y.U. individualized approach and those who used the whole-class approach over a two-year period of time, the findings were these:

1. In formal spelling for students who were in grades 2-3, 3-4, 4-5, and 5-6 during the two-year study, significant differences were found in favor of the B.Y.U. individualized approach in the 3-4 and 4-5 grades. There were no significant differences in the performance of students who used the two approaches in grades 2-3 and 5-6.

2. In formal spelling for students who were in grades 2-3, 3-4, 4-5, and 5-6, significant differences were found in favor of the B.Y.U. individualized approach for students of high reading ability in the 4-5 grades. Significant differences were also found in favor of the B.Y.U. individualized approach for students of medium reading ability in grades 3-4 and 4-5. For students with low reading ability, significant differences were found in favor of the whole-class approach in grades 2-3 and in favor of the B.Y.U. individualized approach in grades 3-4.

3. In functional spelling for students who were in grades 4-5 and 5-6 during the two years, significant differences were found for both groups in favor of the B.Y.U. individualized approach.

4. In functional spelling for students who were in the 4-5 and 5-6 grades, significant differences were found in favor of the B.Y.U individualized approach for students of high reading ability in the 5-6 grades. No significant differences were found for students of high reading ability in grades 4-5 or

for students of medium or low reading ability in grades 4-5 or 5-6.

5. In analyzing the differences between the individualized and whole-class approaches to spelling instruction, twenty-four different groups of student scores were compared for the two-year study. Of the twenty-four groups tested, significant differences were found in ten. Nine were in favor of the individualized approach and one, a low reading ability group in the 2-3 grades, was in favor of the whole-class approach. In the remaining fourteen cases, the differences, though not significant, were in favor of the individualized approach.

When student performance was tested between the first and second years of those who used the B.Y.U. individualized approach both years

1. In formal spelling for students in grades 3-4, 4-5, and 5-6, significant differences were found for students in the 4-5 grade during the first year they used the approach. There were no significant differences between the performance of the first and second years for students in 3-4 and 5-6 grades.

2. In functional spelling for students in 4-5 and 5-6 grades, significant differences were found for students in the 5-6 grades during the first year they used the approach. There were no significant differences between the performance of the first and second years for students in the 4-5 grades.

When student performance was tested between the first and second years of those who used the whole-class approach both years

1. In formal spelling for students in 3-4, 4-5, and 5-6 grades, significant differences were found for students in the 4-5 grade during the first year they used the approach. There were no significant differences

between performance of the first and second years for students in the 3-4 and 5-6 grades.

2. In functional spelling for students in 4-5 and 5-6 grades there were no significant differences between the first year they used the whole-class approach and the second year they used the whole-class approach.

When second-year student performance was tested between those who used the B.Y.U. individualized approach and those who used the whole-class class approach for two years

1. In formal spelling for students in grades 2-3, 3-4, 4-5, and 5-6 there were no significant differences between the two approaches.

2. In functional spelling for students in the 3-4, 4-5, and 5-6 grades there were no significant differences between the two approaches.

Conclusions

Of the twenty-four groups tested in the two-year longitudinal study, significant differences were found in ten. Nine were in favor of the individualized approach and one, a low reading ability group in the 2-3 grades, was in favor of the whole-class approach. In the remaining fourteen cases, the differences, though not significant, were in favor of the individualized approach. These findings led to the following conclusions:

1. In all cases, with the exception of low reading ability students in the third grade, the individualized approach is responsible for as much student progress as is the whole-class approach. It is responsible for significantly more progress in several instances.

2. During the first year study, of the twenty-nine comparisons between

individualized and whole-class approaches, significant differences were found in only four cases. Each favored the individualized approach. During the second year, of the twenty-nine comparisons between the individualized and whole-class approaches, significant differences were found in only one instance. It was in favor of the B.Y.U. individualized approach. Of the twenty-four cases analyzed over the two-year period, ten significant differences were found. Nine favored the individualized approach. This led to the conclusion that except for children of low reading ability in the primary grades, children who use the individualized approach over a two-year period of time progress in spelling achievement as much as or more than students who use the whole-class approach.

3. In formal spelling in grades 2-3, 3-4, 4-5, and 5-6 significant differences were found in grades 3-4 and 4-5 in favor of the B.Y.U. individualized approach. It appears that the B.Y.U. individualized approach permits children to make significantly greater growth in formal spelling in the late primary and early intermediate grades than does the whole-class approach. It is possible that most of a child's spelling growth has taken place before he reaches the sixth grade. If this is the case, it possibly accounts for the lack of significant difference between the two approaches in the 5-6 grades.

4. In formal spelling for students with high, medium, and low reading ability, significant differences were found in the 4-5 grades for students with high reading ability, in the 4-5 grades in medium reading ability, and in the 3-4 grades for students with low reading ability. Each of these was in favor of the individualized approach. Students with low

reading ability in the 2-3 grades who used the whole-class approach showed significantly greater growth. From these findings it appears that the individualized approach produces as much or more growth for students of all three reading abilities in all grades except for students with low reading ability near the beginning of their schooling. It appears that these students with low reading ability benefit from direct group instruction.

5. In functional spelling for students in grades 4-5 and 5-6 during the two years, significant differences were found for both groups in favor of the individualized approach. It appears that the individualized approach helps children in the intermediate grades significantly more in their functional spelling than does the whole-class approach.

6. When student performances were compared on the basis of high, medium, and low reading ability in grades 4-5 and 5-6, significant differences were found for students with high reading ability in grades 5-6. It appears that the individualized approach benefits those students with high reading ability in the upper intermediate grades.

7. In formal and functional spelling, when student performance was compared between the first and second years of those who used the individualized approach both years, out of six possibilities significant differences were found in two. One was in formal spelling for students in the 4-5 grades and the other was in functional spelling for students in the 5-6 grades. In both cases students made significantly more growth during the first year. When a similar comparison was made between first and second year performance for students who used the whole-class approach both years, only one significant difference was found in grades 4-5 in formal spelling. This difference was

also in favor of the first-year growth. From these findings it appears that in most instances students do as well during the second year they use either the individualized or whole-class approach as they do the first year. When differences do occur, it appears that students make more growth during the first year than during the second for both methods. The possible reason for this first-year difference may be due to the influence of the novelty of a new experience. People often show greater improvement when they use something new than they do when they work with that which is familiar.

8. No significant differences were found in formal spelling in grades 2-3, 3-4, 4-5, or 5-6 or in functional spelling in grades 3-4, 4-5, or 5-6 between the two approaches to spelling during the second year the students used the approaches. Differences that did exist, though not significant, were in favor of the individualized approach. Based on these findings and the results of the first-year study, it appears that one year only, either the first or second year the methods are used, is not sufficient time for most significant differences to occur between performance of students who use the two methods.

IV

SUMMARY OF THE THREE STUDIES AND RECOMMENDATIONS

Description of the Studies

Two different approaches to spelling instruction were used during the first-year study. Students at the B.Y.U. Elementary Laboratory School and at the Maeser School in Provo, Utah, and at the East Elementary School in Cedar City, Utah, used the individualized approach developed by the staff at the Brigham Young University Laboratory School. Students at Provost and Joaquin Elementary Schools in Provo, at West Side School in Springville, and at Peteetneet School in Payson used a whole-class approach. Two classes of each grade at East Elementary and one class from each grade in each of the other schools were included in the study.

Four approaches to spelling instruction were used in grades four, five, and six during the second year. Upper grade students at B.Y.U. Elementary Laboratory School and one fourth grade, one fifth grade, and one sixth grade class at East Elementary School used the B.Y.U. individualized approach with the addition of the S.R.A. Spelling Laboratory. Upper grade students at Joaquin and West Side added the S.R.A. Laboratory to the whole-class method. All others in the study continued with the methods used during the first-year study.

Data for the longitudinal study were taken from the scores of those students who used the same method, either individualized or whole-class, during the entire two-year period.

Students who used the individualized approach studied at individual levels of difficulty and at their own rates of progress. In the whole-class approach, students studied at levels appropriate for each grade and the whole class worked at the same level and rate with the assumption that the needs of students could be satisfied most efficiently when the teacher's attention was devoted to the requirements of the majority of the class. Individual differences were handled in the whole-class approach by permitting students to study all or part of the assigned materials according to their needs.

During the second year, half of the students in the fourth, fifth, and sixth grades who had been using the individualized approach and half in these grades who had been using the whole-class approach added the S.R.A. Spelling Laboratory to their spelling programs. These students used basically the same procedures, either individualized or whole-class, which they had followed the first year, but part of the time was spent with the S.R.A. Laboratory, a multi-level, individualized program designed to teach spelling principles and generalizations.

Problems

First-Year Study Questions

Answers to the following questions were sought in the first-year study:

1. Which spelling method, the B.Y.U. individualized approach or the

whole-class approach, produces the most spelling progress for students in grades two through six as measured by a formal spelling test?

2. In grades three through six which of the two approaches produces the most formal spelling growth for students with high reading ability, with medium reading ability, and with low reading ability?

3. Which of the two spelling approaches produces the most functional spelling progress for students in grades four, five, and six as measured by the number of spelling errors occurring in structured written exercises?

4. In grades four through six which of the two approaches produces greatest functional spelling growth for students with high, medium, and low reading achievement?

Second-Year Study Questions

The questions raised during the second-year study included the following:

1. Which spelling approach, the B.Y.U. individualized or whole-class, produces the most formal spelling growth for second and third grade students and for third grade students with high, medium, and low reading achievement?

2. Which of four approaches to spelling instruction—the B.Y.U. individualized, the whole-class, the B.Y.U. individualized plus the S.R.A. Laboratory, or the whole-class plus the S.R.A. Laboratory—produces the greatest formal and functional spelling growth in grades four, five, and six.

3. Which of the four methods produces the greatest formal and functional spelling growth in grades four, five, and six when the sample is divided into students with high, medium, and low reading ability?

Two-Year Longitudinal Study Questions

Answers to the following questions were sought in the two-year longitudinal study:

1. Which spelling method, the B.Y.U. individualized approach or the whole-class approach, produces the most spelling progress for students in grades two through six during a two-year period of time?

2. In grades three through six which of the two approaches produces the most formal spelling growth over a two-year period of time for students with high reading ability, medium reading ability, and low reading ability?

3. Which of the two spelling approaches produces the most functional spelling progress over a two-year period for students in grades four through six?

4. Which of the two approaches produces the greatest functional spelling growth over a two-year period for students in grades four through six with high, medium, and low reading achievement?

5. What significant differences exist, if any, between the formal spelling growth of students in grades two through six and functional spelling growth in grades four through six during the first year they use the B.Y.U. individualized approach and the second year they use this approach?

6. What significant differences exist, if any, between the formal spelling growth of students in grades two through six and functional spelling growth in grades four through six during the first year they use the whole-class approach and the second year they use this approach?

7. Which of the two approaches produces the greatest formal spelling growth in grades two through six and functional spelling growth in grades four through six during the second year the two approaches are used?

Summary of Findings

First-Year Study Findings

In the first-year study when spelling performance was compared between students who used the B.Y.U. individualized approach and students who used the whole-class approach, significant differences were found for the following groups:

1. In formal spelling significant differences were found in the second grade for the class as a whole and for students with high reading ability in grades three and six in favor of the individualized approach.

2. In functional spelling significant differences were found in grade four in favor of the individualized approach.

3. Out of twenty-nine comparisons there were nineteen in favor of the individualized approach, four of which were significant, and ten in favor of the whole-class approach, none of which were significant.

Second-Year Study Findings

In the second-year study when spelling performance was compared between students who used the B.Y.U. individualized approach and students who used the whole-class approach, the B.Y.U. individualized approach plus the S.R.A. Laboratory, and the whole-class approach plus the S.R.A. Laboratory, significant differences were found for the following groups:

1. In formal spelling significant differences were found for students with medium reading ability in the fourth and sixth grades. In the fourth grade the significant differences were in favor of the individualized approach plus the S.R.A. Laboratory over the whole-class approach and the whole-class approach plus the S.R.A. Laboratory. In the sixth grade the

significant differences were in favor of the individualized approach over each of the other three methods.

2. In functional spelling, significant differences were found in the fourth and fifth grades when the entire grades were compared and in the fifth grade for students with low reading ability. In the fourth grade significant differences were in favor of the individualized approach plus the S.R.A. Laboratory over each of the other three methods. In the fifth grade the significant difference was in favor of the individualized approach plus the S.R.A. Laboratory over the individualized approach and the whole-class approach. For students with low reading ability in the fifth grade significant differences were in favor of both the individualized approach plus the S.R.A. Laboratory and the whole-class approach plus the S.R.A. Laboratory over both the whole-class and individualized approaches.

3. Each of the four methods was compared with every other method twenty-four times. Five additional comparisons were made between the individualized and whole-class approaches.

Of the twenty-nine comparisons made between the whole-class and individualized approaches, twenty were in favor of the individualized approach, one of which was significant. Nine were in favor of the whole-class approach, of which none were significant. There were significant differences in favor of the individualized approach plus the S.R.A. Laboratory over the whole-class approach in four instances, over the whole-class approach plus the S.R.A. Laboratory in two instances, and over the individualized approach in three instances. Significant differences were found in favor of the individualized approach over each of the other methods in one instance each. Significant differences were found in favor of the whole-class approach plus the S.R.A. Laboratory over the individualized and whole-class approaches in one instance for each.

Longitudinal Study Findings

In the two-year longitudinal study when spelling performance was compared between students who used the B.Y.U. individualized approach and the whole-class approach, significant differences were found for the following groups:

1. In formal spelling significant differences were found in the 3-4 and 4-5 grades when the entire classes were compared, for the students with high reading ability in the 4-5 grades, and for students with medium reading ability in the 3-4 and 4-5 grades, and for students with low reading ability in the 2-3 and 3-4 grades. The significant differences were in favor of the whole-class approach for students with low reading ability in the 2-3 grades. In all other instances the differences were in favor of the individualized approach.

2. In functional spelling significant differences were found in the 4-5 grade and 5-6 grade when compared as entire classes, and for students of high reading ability in grade 5-6.

3. In the two-year longitudinal study twenty-four different comparisons were made betweeen the whole-class and individualized approaches. Twenty-three were in favor of the individualized approach,of which nine were significant. One was in favor of the whole-class approach. It was a significant difference.

4. When first-year performance was compared with second-year performance of the same students, there were significant differences in favor of the first

year in three cases. In the individualized approach there were two significant differences, in grades 4-5 and 5-6, and in the whole-class approach there was one significant difference in grade 4-5.

Summary of Conclusions

1. Since the longitudinal study revealed more significant differences between the methods tested than either the first or second year study, it was concluded that the use of a method over an extended period of time is a valuable factor in judging the efficiency of an individualized or whole-class method of spelling instruction.

2. Except in one instance, the significant idfferences between the individualized and whole-class methods were in favor of the individualized method. It is concluded that generally the individualized method is responsible for as much growth in spelling as is the whole-class method, and in many cases it is responsible for more.

3. When the sample was divided into reading ability groups, the findings of the studies indicate that with the exception of students of low reading ability in the primary grades the individualized approach is responsible for as much spelling growth for students with high reading ability, students with medium reading ability, and students with low reading ability, and in several instances for more.

4. The findings of the studies indicate that in both formal and functional spelling growth the individualized approach is responsible for at least as much progress as is the whole-class approach and in many cases for more.

5. Since fewer than half the comparisons made in the longitudinal study

revealed significant differences and few significant differences existed in either the first-year study or the second-year study, it was concluded that the whole-class method can be considered responsible for growth in spelling made by students who used that method.

6. The one significant difference in favor of the whole-class method occurred in the longitudinal formal spelling performance of students who were in the second grade during the first year and in the third grade during the second year who had low reading achievement. It was concluded that there appear to be benefits in the whole-class approach for students at these grade levels who have low reading achievement.

7. The second-year study revealed that a systematic, individualized program of instruction in spelling principles is a valuable addition to either the whole-class or individualized method, particularly in grades four and five and with students of medium or low reading ability. Use of such a program appears to have more effect upon the functional spelling performance of students than on their formal spelling test scores.

Recommendations

The findings and conclusions of the first-year study, the second-year study, and the longitudinal study resulted in the following recommendations:

1. Because the individualized approach produced in practically all instances as good or better results as the whole-class approach, it is recommended that the individualized approach be used by teachers who are able to adapt to the approach and who agree with its basic philosophy.

2. Since significant differences were not found in many instances, it is recommended that the whole-class approach be used by teachers who agree more with the whole-class philosophy, or teachers who would have difficulty using the individualized approach.

3. It is recommended that teachers in the primary grades consider adapting the individualized procedures to include some of the elements of the whole-class method for students with low reading ability. These students at this level appear to benefit from more teacher direction than is possible in the individualized approach.

4. It is recommended that the individualized approach be considered appropriate for most students with high, medium, or low reading ability with the one exception in the primary grades noted above.

5. A systematic, individualized program in instruction in spelling principles and generalizations would be a helpful addition to individualized or whole-class procedures for fourth or fifth grade students, particularly those with medium or low reading ability.

6. It is recommended that studies comparing methods of elementary instruction be conducted for at least a two-year period of time.

APPENDIX

WHY ANALYSIS OF COVARIANCE WAS USED

When educational research is conducted, it is very desirable that the sample populations with which the researcher works are identical. This is rarely the case, however, and before final differences between two sample populations can be attributed to some experimental treatment, all other things being equal, it is necessary to adjust for initial differences.

In order to adjust for initial differences, the statistical procedure known as analysis of covariance can be used. When this procedure is used, adjustments are made in order that data between two sample populations can be compared even though these populations were not at the same initial point when the study began. This is accomplished by using a formula that takes into consideration all initial and final scores in relationship to each other and provides an adjusted score that is based on initial differences in relationship to final scores. This makes possible a comparison of adjusted scores as if no initial differences existed. In the present study, the spring, or final, scores are the adjusted scores and are the ones that indicate whether or not differences existed as a result of something other than initial differences.

Whether or not one treatment yields significantly different results from another is dependent upon the difference between the adjusted mean scores and the variance associated with the groups on which the means are based.

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